

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,878,973 B2
DATED : April 12, 2005
INVENTOR(S) : Christopher Haydn Lowery and Troy Trottier

Page 1 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete Title page illustrating figure, and substitute therefor new Title page illustrating figure; (attached).

Delete drawing sheets 1-2, and substitute therefor drawing sheet 1, with the attached sheet.

Signed and Sealed this

Eleventh Day of October, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Lowery et al.

(10) Patent No.: **US 6,878,973 B2**
(45) Date of Patent: **Apr. 12, 2005**

(54) **REDUCTION OF CONTAMINATION OF LIGHT EMITTING DEVICES**

(75) Inventors: Christopher Haydn Lowery, Fremont, CA (US); Troy Trottier, San Jose, CA (US)

(73) Assignee: Lumileds Lighting U.S., LLC, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 134 days.

(21) Appl. No.: **09/938,407**

(22) Filed: **Aug. 23, 2001**

(65) **Prior Publication Data**

US 2003/0071568 A1 Apr. 17, 2003

(51) Int. Cl. ⁷ **H01L 33/00; H01L 23/29**

(52) U.S. Cl. **257/100; 257/98; 257/99;**

257/789; 257/795

(58) Field of Search **257/98-100, 729,**
257/753, 788, 789, 791, 795; 438/26, 28,
29, 34-35

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,561,329 A • 10/1996 Mine et al. 257/788
6,132,569 A • 10/2000 Shiozaki 204/192.27
6,455,878 B1 • 9/2002 Bhat et al. 257/99
2002/0187571 A1 • 12/2002 Collins, III et al. 438/29

FOREIGN PATENT DOCUMENTS

EP 0 926 744 A2 6/1999

* cited by examiner

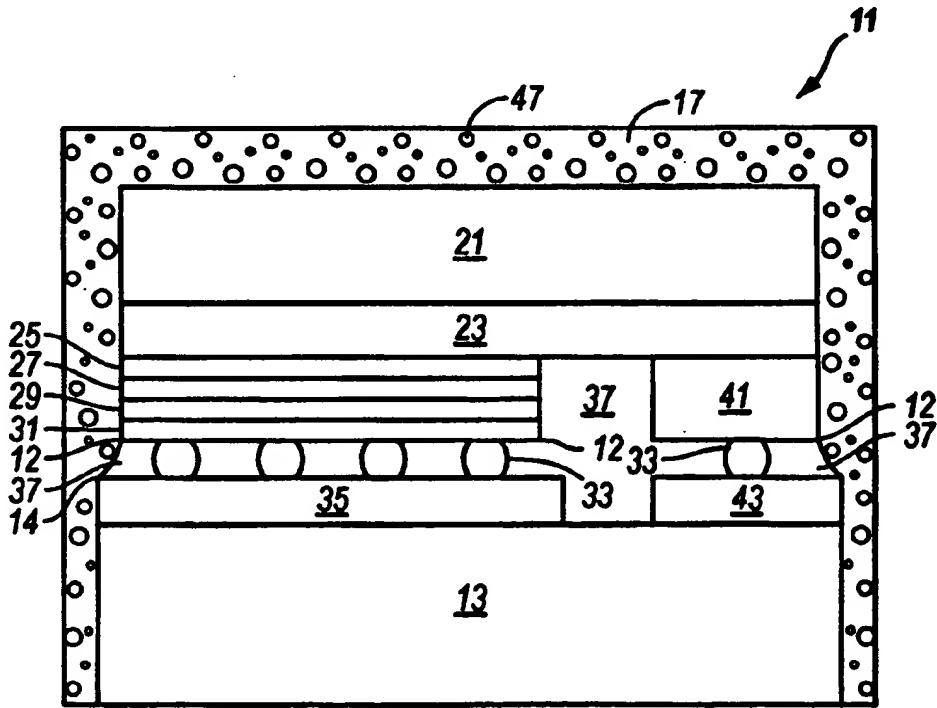
Primary Examiner—Donghee Kang

(74) Attorney, Agent, or Firm—Patent Law Group LLP

(57) **ABSTRACT**

A light emitting device and a method of making the same are provided. The light emitting device includes a light emitting diode and a submount. A phosphor material is disposed around at least a portion of the light emitting diode. An underfill is disposed between a first surface of the light emitting diode and a first surface of the submount. The underfill reduces contamination of the light emitting diode by the phosphor material.

36 Claims, 2 Drawing Sheets



U.S. Patent

Apr. 12, 2005

Sheet 1 of 1

6,878,973 B2

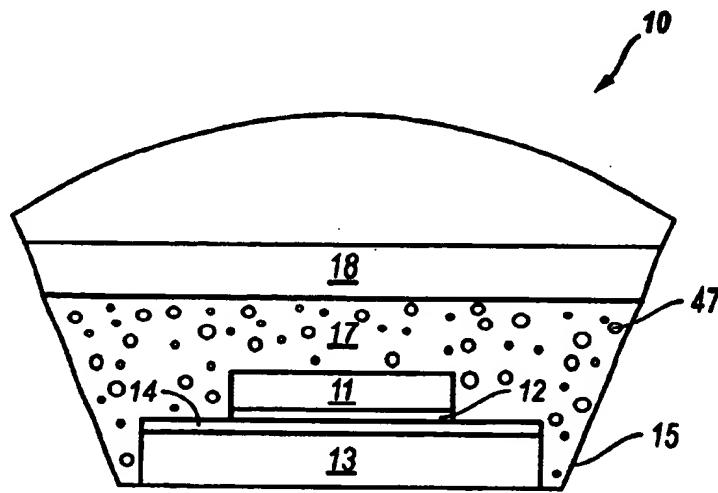


FIG. 1

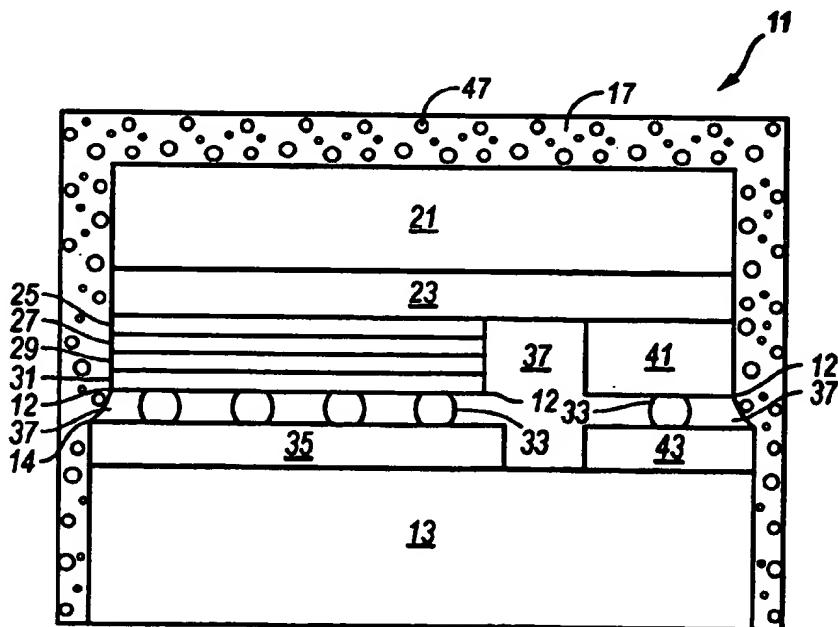


FIG. 2